365* Patient satisfaction with physiotherapy techniques for airway clearance in Cystic Fibrosis

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Aims: Studies of airway clearance techniques (ACTs) in cystic fibrosis (CF) have shown low levels of adherence. We aimed to measure patient satisfaction with the various ACTs performed in our adult CF clinic using a validated instrument.
Methods: All CF patients attending outpatient clinic over a one month period completed an ACT satisfaction survey (validated by Oermann et al. 2000) for each ACT they had used on at least 5 occasions in the previous 6 weeks. For each ACT, 17 questions relating to ACT satisfaction (efficiency, convenience, comfort, overall satisfaction) were answered on a 5-point Likert scale. Comparisons between ACTs were conducted with sharpened Bonferroni correction for multiple tests. Comparisons of pooled scores were then conducted for assisted vs independent ACT and exercise vs other ACT.
Results: The 41 patients (18 female) surveyed had a mean (range) age 28 (19–50) years and FEV1 52 (17–110)% predicted. Most patients used multiple techniques, resulting in 145 technique satisfaction scores. Satisfaction scores were generally high for these self-selected techniques, ranging from a mean of 60.2/85 (cough alone) to 70.6/85 (breathing techniques). Positive expiratory pressure devices (PEP/Flutter) and breathing techniques (ACBT/AD) were significantly higher in satisfaction score than cough alone ($p = 0.01$, $p = 0.00$). Satisfaction did not significantly differ between independent and assisted ACTs. The mean satisfaction score for all exercise types specifically to promote airway clearance was significantly lower than other ACTs ($p = 0.05$).
Conclusions: Adult CF patients at the RPAH clinic perform a wide variety of ACTs and report high levels of satisfaction. Given the potential implications for adherence, further research into patient satisfaction with ACTs is warranted.

366 The Modified Shuttle Test (MST): The development of reference values in adult patients with Cystic Fibrosis

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Introduction: Measuring exercise capacity is widely accepted as an instrument in predicting prognosis and evaluating treatment of patients with Cystic Fibrosis (CF). A functional approach to measure this capacity is to use an instrument that closely relates to everyday life. The Modified Shuttle Test (MST) is a field test for adult patients with CF with proven reliability, repeatability and sensitivity in this patient group.
Aims: The aim of our study is to describe the relationship between the MST and other factors within the Disablement Process in order to make a preliminary attempt in predicting exercise capacity. The availability of reference values is an important condition for the usefulness of this instrument.
Methods: Currently, 103 patients (63 male; mean age 28 yrs, range 17–52) are included in this study. Measures of "Body Functions" were expressed by lung function [percentage of predicted FEV1 (FEV1-%pred)], muscle strength, body mass index, and oxyhemoglobin saturation before and during exercise. "Activities" were measured using the MST. "Participation" was assessed using the Cystic Fibrosis Questionnaire (CFQ 14+).
Results: Preliminary data indicate that MST outcome correlates highly ($r = 0.75$; $p < 0.01$) with FEV1-%pred and moderately ($r = 0.66$; $p < 0.01$) with self-reported physical functioning (CFQ 14+). When assessing data of male and female patients separately, associations become even more apparent.
Conclusions: A relationship exists between "Activities" as measured by the MST and "Body Functions" as measured by the FEV1 on the one hand and "Participation" level on the other. These relationships are of paramount importance in future research to develop predictive models of prognosis in patient with CF. We attempted to create reference values using our data.

367 Use of two different equipments of high frequency oral oscillation in cystic fibrosis patients (CFP)

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Introduction: CFP have abnormal pulmonary secretions that cause airway obstruction, inflammation and infection. The chest physiotherapy (CPT) is an important part of the patients' care because help airway clearance and prevent pulmonary secretion accumulation.
Objective: To compare the Flutter VRP1 and Shaker devices with respect wet and dry sputum weight, pulse and pulse oximetry in CFP.
Methods: Clinically stable patients with cystic fibrosis (mean age, 12.6 years). Two treatments regiments were used: in the first session Flutter or Shaker, and after seven days, in the second session Shaker or Flutter. Sputum was collected during 15 and 60 minutes after each session, the wet sputum weight was measured and transferred to a drying oven. Cardiac frequency and pulse oximetry was performed during and 1 hour after the treatment.
Results: Sixteen patients were studied. The mean+/-SD differences between Flutter and Shaker in wet sputum weight were 0.37 ± 2.9 g, not significantly different ($p = 0.7197$), for dry sputum weight were -0.01 ± 0.1 g, either not significantly different ($p = 0.5897$). There were no significant changes in pulse or pulse oximetry before or after treatment between devices.
Conclusion: The use of Shaker device was as effective as Flutter VRP1 in these patients.

368 Inhaling hypertonic saline – a useful method to obtain sputum in children and adults with CF

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Introduction: Early identification of pathogens, especially *Pseudomonas aeruginosa* (PA) and *Burkholderia cepacia* (BC) is crucial in CF patients. This study aimed to find an effective way to obtain sputum samples from children and adults without causing discomfort or obstruction. We also wanted to see whether new pathogens could be detected after a 5% hypertonic saline inhalation (HSI).
Method: 39 patients with CF > 5 yrs were included (mean age 20 years (range 6–42). 13 of them were chronically colonised with PA and 2 with BC. 18 of the patients had previously had major difficulties to produce a sputum sample. Prior to a 5-minute HSI, the patients inhaled their usual bronchodilators, mucolytics and performed their usual mucus clearance techniques. Sputum samples were obtained before and after HSI. Spirometry was performed before and 10 min after HSI. All side effects during or after the procedure were recorded.
Results: 35 patients were able to produce sputum samples; 23 before and after HSI; 11 patients only after HSI and 1 patient only before HSI. 4 patients were unable to produce any sputum sample at all. Mean change in FVC before and after HSI was –3% (range –18 to +7) and in FEV1 –1% (range –17 to +11). 8 patients described minor side effects (coughing/chest tightness) during or immediately after HSI. The discomfort disappeared within 10 minutes. There were no new pathogens found comparing pre and post HSI samples.
Conclusions: In our study short inhalation of hypertonic saline was a safe and effective way to obtain sputum samples from CF children and adults who previously had difficulties to expectorate sputum. However we were unable to detect any new pathogens with this method contrary to previous reports. Therefore HSI is not necessary if normal sputum samples can be obtained.